

joint. As clinical experience is gained and technical improvements are made, the technique should also become important in the initial assessment of synovial inflammatory disorders.

In the spine, MRI offers accuracy comparable to that of CT and myelography in the diagnosis of intervertebral disc herniation and is more sensitive to early disc degeneration. In addition, the method can assist in the early diagnosis and characterization of disc space infections and may be beneficial in the follow-up of patients who have undergone a spinal operation or chemonucleolysis.

Patients with total joint replacements and other orthopedic hardware can be safely evaluated by MRI, and image degradation by artifacts is less of a problem than with CT. The technique has also been successfully applied to diverse orthopedic conditions, including the carpal tunnel syndrome, Legg-Calvé-Perthes disease, rotator cuff tear and other glenohumeral joint disorders, stress fractures and pedal neuromas. The potential of MRI as applied to orthopedic disease is yet to be fully explored, and spectroscopy of phosphorus 31 as well as other nuclei may yield valuable insight into the physiologic aspects of such disorders in the future.

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Meniscal Repair

A SYMPTOMATIC meniscal tear, especially in the young, is a serious injury with potentially grave consequences for the knee because the menisci enhance joint stability and reduce the compressive forces sustained per unit area of articular cartilage.

The therapeutic approach to meniscal tears depends on the tear type, location, associated ligamentous injuries and the age and activity of the patient. Treatment options include meniscectomy, partial meniscectomy and meniscal repair. Total meniscectomy is rarely necessary and is not to be undertaken lightly as degenerative arthritis may result. Arthroscopic partial meniscectomy spares portions of the meniscus, allowing for partial fulfillment of its weight-bearing and joint stabilization roles. Although degenerative changes are less likely to develop, joint mechanics are still altered. Meniscal repair, if feasible, preserves normal knee mechanics and logically should provide superior long-term results.

Certain meniscal tears should and do heal. The outer (peripheral) 25% of the meniscus has been shown to be vascular, and healing originates from the peripheral synovial tissues. Meniscal repair can be achieved by open (arthrotomy) and closed (arthroscopy) methods. The arthroscopic method affords greater access to the posterior horn of the lateral meniscus, tears slightly within the meniscocapsular junction and tears deep to the collateral ligaments.

Arthroscopic meniscal repair involves four steps: selecting appropriate tears, preparing the tear margins and adjacent synovium, suturing the tear and rehabilitating postoperatively. Meniscal tears amenable to repair are longitudinal tears more than 1.5 cm within the vascular zone, without serious secondary tears and with demonstrable hyper-

mobility. In addition, ligamentous stability is required. In our experience, 15% of all meniscal tears are repairable.

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Sports Footwear

SIGNIFICANT ADVANCES have occurred in the design and manufacture of sports footwear. The use of impact-absorbing synthetic plastics such as polyurethane and ethylene vinyl acetate has resulted in lighter weight shoes that are resilient and durable yet flexible.

Scientific studies of the mechanisms of sports injuries have found an association with footwear in certain instances. In football, severe knee and ankle injuries can be caused by unyielding foot fixation. This had led to the widespread use of soccer style shoes with molded rubber cleats that develop less torque at the shoe-surface interface than traditional shoes.

Knowledge of the foot and ankle stresses sustained in different activities has stimulated the production of "sports specific" shoes. Shoes specifically designed for running, aerobics and court sports are not interchangeable. For example, running shoes provide hindfoot cushioning and stabilization to withstand loads of as much as three times body weight at heel strike. This is achieved by a thickened sole, a flared heel and a firm, snugly fitting counter. Significant plantar flexion has been shown to decrease cyclic loading of the Achilles tendon.

Court shoes used for tennis and racquetball must accommodate pivoting and lateral movements. Low-profile rubber soles provide increased traction but do not afford the same shock-absorbing capacity as running shoes. In addition, minimal heel elevation that facilitates quick and explosive movements does not relax the Achilles tendon.

The most important criteria in shoe selection are fit and comfort. The longest toe should clear the end of the toe box by half an inch. Leather uppers are generally more expensive but conform best to the shape of the foot over time, thus increasing comfort.

With the exception of barefooted placekickers and occasional runners, the effect of recent developments in footwear has been to maximize performance while decreasing the risk of injury.

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Osseous and Osteochondral Allografts

BONE AND CARTILAGE allografts have proved to be feasible and practical alternatives for reconstructing arthritic joints, obliterating bone defects following trauma or bone dissolution due to various causes and replacing large segments of bone destroyed by bone tumors. The use of allografts to replace large bone defects in revisions for failed total hip replacement has been successful. The allograft bridges the bone defect and provides a scaffold for the ingrowth of vascularized connective tissue that carries the elements necessary for new bone